Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
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Framework for Next Generation 911 Deployment	)	PS Docket No. 10-255
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Comments of the Rehabilitation Engineering
Research Center on Telecommunications Access

Introduction

The Rehabilitation Engineering Research Center on Telecommunication Access (RERC-TAo submits these comments in the above-referenced NOI. The RERC-TA is a joint project of Gallaudet University and the Trace Center of the University of Wisconsin, Madison, funded by the National Institute on Disability and Rehabilitation Research of the U.S. Department of Education.[1]

The authors of this comment have conducted a variety of studies in matters related to the accessible emergency service issues. The questions about accessibility aspects of NG-9-1-1 are closely related to the RERC-TA's area of work.

The responses focus on a few questions of central interest for development of accessible emergency services.

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A. NG911 Capabilities and Applications

1 Potential Media Types in an NG911 Environment

We identify and discuss the most likely media types below, and seek comment on the potential for each of the media types to be supported in the development and deployment of NG911 networks. We also seek comment on whether there are any additional media types that we should consider for inclusion in NG911.

33. Message-Based Text.

SMS and message-based text are important media types. Some prefer messaging in daily communication because it allows time multiplexing, some because it allows them to see their message before it is sent. Some, simply because it is ubiquitous and interoperable. This is particularly true of SMS, whose ubiquity makes it very popular despite that fact that it can be slow and unreliable. The fact that it is not session-based, also makes it hard to detect when, or even if, a *communication* or *transmission* is successfully received. However SMSs support on virtually every cell phone today makes it a mainstay means of communication, and an essential form of mobile communication for those who cannot speak. For these same reasons, it is an essential mechanism for communication with 911 despite its limitations in speed and reliability. And this is likely to remain true until another form of text communication eventually evolves which is equally ubiquitous and provides similar functionality.

Session-based communication (IM) has many advantages over SMS including the ability to know that communication got through and essentially instant communication once the message is completed and sent. Its lack of interoperability though and the fact that it requires a more expensive data plan (and a different addressing scheme) has caused it to be used primarily on computers though some use it on smart phones. There are many proprietary and competing protocols for implementing IM , and PSAPs can not be supposed to implement a large number of proprietary protocols. Its utility for message based conversation however is sufficient that conversion to standardized protocols for use between message service providers and PSAPS seems important.

Message based communication is slower than realtime text conversation that was common for TTY (except for fast typists who ran into TTYs limited baud rate). Also messaging does not

work well for captioned telephony. The message is only sent to the other person at the end of the utterance (actually several seconds after the end of the utterance) when the speaker has moved on to the next topic or when the other person is supposed to be responding, not waiting for the last thing said to still arrive.

34. Real-Time Text.

As indicated in the NOI, Real-Time text is an important medium that provides opportunities to have smooth and rapid communication between users and PSAPs in text, often in combination with other media. It provides faster communication because the person receiving the message receives it as it is being generated in real time, in the same manner as people who are listening to speech or watching someone sign. When the person finishes speaking the other person can immediately start responding rather than wait for the message to be received and read before being able to respond.

Real-time text also can be sent in parallel with speech (captioned telephony is one example of this). This allows the person to be able to both listen and yet fully understand what is being said even if their hearing or the noise in the background (or a combination of the two) would otherwise prevent them from accurately hearing instructions or important details in what is being said to them.

In emergency situations real-time text has two additional advantages over messaging when real-time text is available. First, it allows the 911 operator to quickly see if the other person is typing the wrong information rather than the information most needed by the 911 operator to determine what type of help is needed and where it needs to be sent. The 911 operator can then interrupt the user early in their message and get them focused on the essentials. Second, it is not uncommon for someone sending a 911 message to be cut off before they finish their first utterance. They may pass out, be pulled away by circumstance or be prevented from finishing the sentence by their abuser or attacker. "help I am having a heart a…." "Someone is breaking into my h…" With speech, sign, or real-time text the message is received up until the point where it is interrupted. And the sudden interruption and lack of response also give the 911 operator additional information. With messaging based text, nothing is sent if the first utterance is not fully completed and sent.

35. Still Images (Photos).

Still images can surely sometimes provide valuable extra information, while in general video may be easier to handle and make important use of in emergency situations. As high quality video and broader bandwidths become common, video may take the place of pictures (on a 911 call) with the 911 operator having the ability to play back or take a snapshot from their end as needed. The ability to send pictures today without a IP connection however makes them valuable for providing details assessment and passing it on to responders.

36. Real-Time Video.

As noted above real-time video can be an important to invaluable source of information to 911 responders. It can help them if the person is not able to communicate well for any reason (noise, shock, etc) , if the person is confused, or if the person is not able to accurately describe an injury etc. It can also give the 911 responder important information on the situation.

It most important role however for those who natural language is sign language, is that ability to allow them to communicate in their native language. Some may not be proficient communicating in text (of a spoken language). Others may find it difficult when in shock or under stress.

37-38 Telemetry Data, Auxiliary Medical and other Personal Data.

These are also important for everyone – but may have additional importance to people who have disabilities (or injuries) that interfere with their normal means of communication.

2. Primary vs. Secondary Usage of Media Types

In the NOI it was stated that ***primary media will likely include voice, RTT, and text-based messaging (SMS, instant messaging), because to differing degrees, all of these media types will permit live conversations between the 911 caller and the PSAP***. Video was listed as a secondary mechanism. We would like to suggest strongly that ***video*** be added to the list of ***primary*** media that is used for live conversation between 911 caller and the PSAP because of its role in allowing live conversation in sign language. The 911 operator may sign back directly or they may have a sign language interpreter on the call with them, but although video may have secondary uses as well, it should be include in the primary media category as well.

The primary media types may be different in different directions in the call. Some examples:

- Transmit video for sign language, together with real-time text for spelling out addresses, names etc.
- Simultaneously transmit audio to the PSAP to judge sounds on the site.
- Receive video for sign language, together with real-time text for spellings.

All other kinds of combinations and subsets are also valid. All combinations are of interest.

The basic set of audio, video, real-time text and a small number of messaging text variants should always be supported.

3. SMS for Emergency Communications

The limitations of SMS are likely not widely known, and information about it should be provided. SMS's ubiquity today, and the fact that it is likely to be the only universally supported type of text for the next 5 to 10 years make is essential that it be supported, especially in the short run, despite its limitations.

4. NG911 Applications for Persons with Disabilities and Special Needs

This has been discussed above. This is valid for non-English speakers also.

B. NG911 Network Architecture

3. Interoperability and Standards

It is essential that a set of standards are assigned to be the call control functions and default media codecs to be possible to be used in emergency services. Without that, no guarantee for interoperability can be assured. Calls cannot be assured to flow from one part of the network to another so delivery cannot be assured. This is especially true since users will not know where they will need to use 911 or what systems would be supported there. Market pressures have not led to text interoperability (aside from SMS) like they have for voice. In fact market pressure on text has been to create different proprietary systems that do not interoperate except by third parties – and then imperfectly.

Interoperability in the key areas needed by disability require standards be specified that all parties involved in transmission and delivery must support. They can also support and use any other standards or proprietary formats but they must support common formats where they interconnect.

Voice and perhaps video will have interoperability. But text has, for different reasons, not had the same market forces as play and special provisions are needed for those who must rely on it. Individuals who are hard of hearing, individuals who are deaf and cannot use sign, people with speech disabilities and those who are deaf-blind.

9. International Issues

It is important that emergency service calls can be made while travelling in other countries. The technical standards used need to be harmonized as well as the routing. This will benefit users, service providers, and manufacturers. But it can be life threatening to users if it is not true for them.

It will be valuable to also be able to involve the relay services in the home country in 911 calls while traveling, because that service can handle the language required by the user.

That may in turn require some change in regulations.

Respectfully Submitted.

/s/

On behalf of the RERC on Telecommunications Access:

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